FORECASTING ELECTRICAL ENERGY DEMAND OF SRI LANKA: GENETIC ALGORITHMS BASED APPROACH

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Abstract

A novel approach for electrical energy demand forecasting (Short term projection) using genetic algorithms is presented. This model is based on genetic algorithms. Possible factors that affect the electrical energy demand of a system have been counted as variables for the model. By subjecting real time past data for 18 years, on each factor, to natural evolution the forecasting model was obtained. Validation of the model has been carried out and results show the effectiveness of the proposed technique.

Forecasting is both a science and an art. The need and relevance of forecasting demand for an electric utility has become a much discussed issue in the recent past. This has led to the development of various new tools and methods for forecasting in the last two decades.

In the past, straight line extrapolations of historical energy consumption trends served well. However, with the onset of inflation and rapidly rising energy prices, emergence of alternative fuels and technologies (in energy supply and end use), changes in lifestyles, institutional changes etc., it has become very important to use modeling techniques which capture the effect of factors such as price, income, population, technology and other economic, demographic, policy and technological variables.

There is an array of methods that are available today for forecasting demand. An appropriate method is chosen based on the nature of the data available and the desired nature and level of detail or forecasting. The proposed methodology is based on Genetic Algorithms, where all possible factors that affect the electrical energy demand of a system are considered.

The forecasted electricity demand with this model for the last two years was with more accuracy compared to the Ceylon Electricity Board forecasted demand; i.e. the

modal forecasted demand in each year (year 2002 and 2003) was very much closer to the actual data.